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ABSTRACT

California State Standard 5.2 is delineated as: Students trace the routes of early explorers and describe the early explorations of the Americas. The Age of Exploration, which began in the late 1400s, was an important era in the discovery and development of land yet unknown to Europeans. During this period, Europeans sought new sea routes to Asia in pursuit of economic gain, glory, and opportunities to spread Christianity. Although these were motivations for explorers, the impact from the discoveries resulted in significant changes and achievements that created possibilities and opened a new world for all of Europe. During the presentation for Grade 5, students are involved with geographic literacy activities and improving their understanding of the obstacles faced by early explorers. Activities are based on a case study of Ferdinand Magellan, a model for use in the study of other explorers. The lesson discusses significance of topic ("Beginning the Topic"; "Developing the Topic"; "Culminating the Topic"); extended and correlated activities; resources for the sample topic; Appendix II-1; Appendix II-2--"Exploration, the First Fifty Years"; Appendix II-3--"Treaty of Tordesillas"; Appendix II-4--"Pigafetta's Journal"; and Appendix II-5--"Directions for Making an Astrolabe." The lesson also contains focus questions; relevant vocabulary; reading, writing, speaking, and listening activities; assessment information; and general resources. (BT)

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CALIFORNIA History-Social Science
Course Models

Age of Exploration

Grade 5 Model Lesson for Standard 5.2

Edited by Dr. Michelle Zachlod

2001

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Age of Exploration

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Unit II

Age of Exploration

5.2 Students trace the routes of early explorers and describe the early explorations of the Americans, in terms of:

1. the entrepreneurial characteristics of early explorers (e.g., Christopher Columbus, Francisco Vasquez de Coronado) and the technological developments that made sea exploration by latitude and longitude possible (e.g., compass, sextant, astrolabe, seaworthy ships, chronometers, gunpowder)
2. the aims, obstacles, and accomplishments of the explorers, sponsors, and leaders of key European expeditions and the reasons Europeans chose to explore and colonize the world (e.g., the Spanish Reconquista, the Protestant Reformation, the Counter Reformation)
3. the routes of the major land explorers of the United States; the distances traveled by explorers; and the Atlantic trade routes that linked Africa, the West Indies, the British colonies, and Europe
4. land claimed by Spain, France, England, Portugal, the Netherlands, Sweden, and Russia on maps of North and South America

Note: Element 4 from State Standard is not found here.

Sample topic addressing elements of Standard 2:
Early exploration of the Americas

Suggested time:
8 class periods
2 weeks

Significance of the Topic

The Age of Exploration beginning in the late 1400s was an important era in the discovery and development of land yet unknown to Europeans. During this period, Europeans sought new sea routes to Asia in pursuit of economic gain, glory, and opportunities to spread Christianity. Although these were motivations for explorers, the impact from the discoveries resulted in significant changes and achievements that created possibilities, and opened a new world for all of Europe.

During the presentation of this topic, students will initially be involved with geographic literacy activities. They will compare and contrast the European geographic view of the world in the 1400s with present day information. This will assist students in an understanding of the obstacles faced by early explorers. In this unit of study, activities center around a case study of Ferdinand Magellan, which should be used as a model for the study of other explorers.

The age of European exploration began in the mid-fifteenth century when Prince Henry of Portugal, known to history as "the Navigator," sent sea captains and their crews down the African coast seeking gold in West Africa. When the Ottoman Turks captured Constantinople in 1453 and blocked the overland route from Europe to Asia, Portugal had an even greater incentive to sail around Africa as a means of establishing a sea route to Asia. The development of new ships, the caravels, and instruments such as the compass and astrolabe made sea exploration more reliable than in the previous century. Geographers of the day knew how to calculate latitude by observing the sun and North Star but since many seamen were illiterate they seldom ventured into unknown waters without relying on sight of land. Prince Henry's school for navigators sought to remedy this. By the time the Portuguese had sailed to the mouth of the Congo River, they were making charts of latitude grids. The Portuguese began a slow and methodical process of sailing down the African coast marking the progress of their explorations with stone pillars, called *padrões*. By 1488 Bartolomeu Dias had sailed around Africa and into the Indian Ocean. The Portuguese, ever wary of the hostile Arab fleets in the Indian Ocean, proceeded with caution.

During this period a young Genoese navigator named Christopher Columbus was in the service of the Portuguese learning useful navigational skills from master mariners. Unable to convince the Portuguese in 1484 to adopt his plan for sailing westward rather than continue their efforts around Africa, Columbus ventured to convince other European monarchs to sanction his voyage. In Spain he faced delays, Henry VII of England turned down the proposal outright, and the French offered no real prospect. Finally, the Spanish court in December 1491 recommended approval of the scheme.

Columbus's successful voyage of 1492-1493 alarmed the Portuguese who were certain that he had sailed into territory claimed by Portugal. King John II of Portugal appealed to the Pope in Rome to settle the issue and prevent possible conflict between Spain and Portugal. Pope Alexander VI examined both Portugal and Spain's claims and issued a decision which established a line of demarcation 100 leagues west of the Cape Verde Islands, extending from the North to the South poles. All unclaimed lands to the east of the line were Portuguese and those

west were Spanish. The decision on the demarcation line reflected such an ignorance of geography that Portugal was squeezed out of the newly discovered lands. Within a year the line was redrawn extending Portuguese lands 200 leagues further west which gave Portugal a foothold in Brazil. Spain later regretted agreeing to the extension of Portuguese territory and claimed that the new line certainly was to extend around the globe thus giving Spain claim to islands in the East Indies. Portugal objected, arguing that the line ran only north and south in the Atlantic and that Spain could only sail west. In 1514 Pope Leo X endorsed Portugal's interpretation. Spain's only hope was to find a passage across the American continent and sail into the Pacific that Balboa had sighted in 1513.

Magellan believed that the Pacific Ocean was much smaller than it is and convinced the King of Spain that he could find a passage through the continent and claim the rich spice islands that were near the American Pacific coast by sailing west. Magellan set sail from Seville on August 10, 1519 with five ships and a crew in excess of 230 men. One ship, the *Victoria* returned to Seville on September 8, 1522 with 31 crewmen (14 others who had been taken prisoner by the Portuguese were later released, making 35 survivors). The cargo of spices on the ill-fated ship was sold for enough money to pay for the entire voyage! Spanish maps of the Philippines were altered so that the islands appeared 25 degrees further east and fell within Spain's claim under the Treaty of Tordesillas.

Voyages of exploration caused political problems among the nations of Europe, especially Spain and Portugal, and accelerated the quest to establish empires. European countries, in addition to seeking new economic gain, saw the opportunity to spread Christianity. The Age of Exploration had profound effects on Europe. New wealth flowed into the region with discoveries of gold and other precious metals, diet changed because of the introduction of new crops, and trade became even more lucrative than it had been in the past. Religious communities, certain that they had a duty to win converts to their faith, encouraged further exploration and settlement. The era, nourished by European dreams of "God, Glory, and Gold," was devastating to the indigenous people they encountered. A study of the exploits of the European explorers is lacking if it fails to include the devastation wrought on peoples they encountered.

The sample lesson offers a good opportunity to explore world geography and investigate the geographic implication of exploration, the exchange it produced, and the risks and opportunities of those who ventured into a world unknown to them.

Focus Questions:

1. Why did people view the world in such a limited way during the 1400's?
2. How do we see the world differently today than people did during the 1400's? Why?
3. Why was it important for explorers to understand and be able to use latitude and longitude?
4. Why were Portugal, Spain, England and France in competition with each other?
5. Why were Portugal, Spain, England and France in competition with each other to find new routes to Asia?
6. Why would an explorer want to go on a long and dangerous voyage to an unknown place?
7. What did explorers do to prepare for their voyage?
8. What did the explorers have to know about using the moon and stars to navigate on the open sea?

Sample Vocabulary Used in This Unit

compass
exploration
sextant
latitude
longitude
navigator
continent
expedition
Big Dipper
compass
chronometer
astrolabe
league
navigator
circumnavigation
hemispheres
doldrums
voyage
Protestant Reformation

Reading

- Students read biographies of Ferdinand Magellan.
- Students will research the instruments used for navigation.
- Students will research a variety of explorers.

Writing

- Students will label maps.
- Students keep individual journals.
- Students prepare a list of provisions and personal items they might take on a voyage of circumnavigation.
- Students fill out graphic organizer on the explorers they study.
- Students write a first person journal as if they were accompanying Magellan.

• Students will write reports on the instruments used for navigation.

Speaking

- Student discuss the passage the teacher read.
- Students discuss their findings on Ferdinand Magellan.
- Students will develop a presentation about the explorers they chose.

Listening

- Students listen to the reading of an introductory passage by the teacher.
- Students listen to an excerpt from the Treaty of Tordesillas.

A
Beginning the Topic

Focus Question: Why did people view the world in such a limited way during the 1400s?

Begin the unit by reading a passage depicting how Europeans viewed the world during the 1400s. An excerpt from *America Will Be*, pages 104-105, may be used. Read the passage to the class and ask students to close their eyes and visualize how Europeans pictured the world. Dramatize the reading by playing ocean music in the background to help set the scene as the passage is read.

Focus Question: How do we see the world differently today than people did during the 1400s? Why?

Discuss the passage and list student responses on chart paper labeled "How Europeans Saw the World During the 1400s." Ask students what they know about the geography of the world today. List their responses on another sheet of chart paper labeled "How We See the World Today." Compare the two charts. Do we see the world differently today? Why?

Compare a modern world map with maps used in the late fifteenth and early sixteenth centuries. Maps are available in numerous texts and historical atlases. Discuss the similarities and differences. Read to the class the short selection entitled "Around a Round World" from *Ferdinand Magellan and the Discovery of the World Ocean* (see "Resources for the Sample Topic") which exposes the myth that during the time Columbus lived Europeans believed the world was flat.

As an introductory activity, students work in groups to create a crayon resist maps of world. Students sketch and firmly color in the continents on a large piece of construction paper. Spread blue water color or tempera paint over the entire drawing; the crayoned areas "resist" adhesion of the paint. After the maps dry, students use black markers to clearly label the continents and oceans. Students learn basic geographic locations and the maps serve as visual aids throughout the lesson.

Focus Question: Why was it important for explorers to understand and be able to use latitude and longitude?

Review basic concepts of latitude and longitude. Instruments that calculated longitude had not been invented at the time Columbus sailed. He and other explorers of the late fifteenth century had to estimate latitude using an astrolabe. The astrolabe is believed to have been a Greek instrument invented by Hipparchus about 150 BCE.

During the course of study of this unit, students keep individual journals that include hand-drawn maps. As passages are read about the Age of Exploration, they record the latitude and longitude of important places and write entries in their journals as if they were on the exploration. Multiple copies of atlases are essential for this unit of study.

B
Developing the Topic

Within cooperative groups brainstorm ideas on the questions, Why would men of that time explore? What were the risks? What were the opportunities and benefits? Share ideas with the class and compile a class list. To examine student responses in more depth, use questions such as: Why would an individual want to explore unknown lands? What's in it for the explorer? Why might the king and queen of a country want people to lead explorations? Would religious leaders encourage exploration? Why might other countries become jealous of a country's explorations? How would the people in the lands you are exploring feel about your presence? Use these questions as an introduction to the motives for exploration.

Display the timeline (Appendix II-1) on an overhead projector to establish the chronology for the document readings in this lesson. Point out the dates for the Line of Demarcation and the Treaty of Tordesillas. Read the excerpt from the Treaty of Tordesillas to the class (Appendix II-3).

Focus Question: Why were Portugal, Spain, England and France in competition with each other to find new routes to Asia?

Students locate the Cape Verde Islands on their maps and draw in the treaty line. Ask the students to consider the following questions: Did the Portuguese believe Columbus's discovery was important? Recognizing how long it took to communicate in the fifteenth century, why do

you think it took less than two months from Columbus' return to Spain to establish a line separating undiscovered lands? Why do you think the line was changed by the Treaty of Tordesillas? If you were the King of England or France, what would you think about the division of the non-European world? Why?

After discussing the Treaty of Tordesillas and the earlier line of demarcation, introduce students to Ferdinand Magellan. Readings may be selected from a variety of books on Magellan such as those by Jim Hargrove, Sergio Bitossi, Rebecca Stefoff, or the chapter on the explorer from *Great Lives: Exploration* (see "'Resources for the Sample Topic'").

Focus Question: Why would an explorer want to go on a long and dangerous voyage to an unknown place?

After students listen to readings on Magellan, discuss the following questions: Why did Magellan leave the service of the Portuguese King and sail for the Spanish? What was the purpose of his voyage? How might Portugal respond if they had known that Magellan would be sailing through areas that they claimed under the Treaty of Tordesillas?

Ask students to consider how sailors were recruited for dangerous and long voyages led by the explorers. What incentives would convince someone to sign up? Have students design posters with at least three incentives that would entice sailors to join the voyage. When the posters are completed, students share them with the class giving a logical rationale for the incentives they chosen.

Ships during this time were extremely cramped and had little room for personal belongings. Ask students to prepare a list of provisions and personal items that they might take on a voyage of circumnavigation, and to give a logical rationale why they chose each one of the items. Discuss the benefits and disadvantages of choosing certain items. Determine what types of foods were taken on long voyages and why. Some important foods were missing from the diets of people who made long ocean voyages and they became sick. Discuss what foods might not be included and why they were important.

Create a wall size graphic organizer that the students can fill in as they research the explorers (see Appendix II-1).

Focus Question: What did explorers do to prepare for their voyage?

On Magellan's voyage, an Italian passenger kept a detailed journal of the voyage. What we know today about this voyage comes not from Magellan but from the passenger, Antonio Pigafetta.

Read aloud select excerpts from Pigafetta's journal (see Appendix II-4). Discuss vocabulary prior to the reading and pause often to answer questions and clarify meanings. The readings may be further excerpted as appropriate for your class. Emphasize the difficulties of the voyage, especially the winds, storms, currents, and doldrums. You may wish to invite a guest speaker who is familiar with sailing to explain the importance of ocean currents and the problems the doldrums presented to sixteenth-century navigators. Ask students why Magellan chose to venture

through the "Strait of All Saints" (Strait of Magellan)? What did Magellan and his captains need to know about geography in order to sail across the Pacific Ocean?

Develop a timeline of Magellan's voyage and chart the route of his ships to the Philippines and the Victoria's return to Spain.

During their study of Magellan, students write their observations of his voyage in their journals in the first person as if they were accompanying him.

Focus Question: What did the explorers have to know about using the moon and stars to navigate on the open sea?

The study of this unit may be further developed to incorporate science and mathematics. Explain that the navigators used star maps to find their direction when sailing in open seas. Refer to *Earth. Moon, and Stars* (see "resources for the Sample Topic") for a lesson activity on using star maps. Students can plot directions using the Big Dipper and the North Star for guidance.

Magellan used the astrolabe, and his knowledge of navigation assisted him in sailing in both the northern and southern hemispheres. Assign students to research the invention of the astrolabe, compass, sextant, and chronometer.

Students can create individual astrolabes, which they will then use in an ongoing homework assignment to chart how many degrees the moon is above the horizon. This should be done at a specific time each evening to accompany drawings of the phases of the moon, and will continue every night for a month. Charts can be discussed and compared in class (See Appendix II-5 for directions on making an astrolabe).

Students also make connections with mathematics in calculating the circumference of the earth and explaining how knowledge of mathematics was important in the circumnavigation of the earth. Science and mathematics activities, along with connections to language arts through reading and writing exercises, contribute to a fully integrated teaching unit.

C
Culminating the Topic

Students, working in pairs, select an explorer to investigate. Use the graphic organizer (see Appendix II-1) as a guide for investigation. Have students brainstorm questions they may wish to know in addition to the headings on the graphic organizer. For example: Why did the country send out the expedition? What motivated the explorer? What were the costs and benefits of their expedition? What special hardships did the expedition face? What were the results of the expedition? How significant were their geographic discoveries?

The timeline in Appendix II-2 lists a number of explorers from which to choose. Use the story of Magellan as a model for researching other explorers. Review library research skills and assist students in their initial research. Provide a selection of books on explorers for the class library for students to read in class. Have students take notes on the explorer they chose.

Students contribute information about their findings to complete the wall chart on explorers.

Once students have completed their initial research, have them meet in larger groups representing the nation that supported the explorer's voyage. Each group then decides on a way in which to present the information such as a panel, skit, or talk-show interview with the explorer's crew. Each group presents the explorations and discoveries of their nation to the class.

Groups draw and label a chart size map of the routes that were taken by their explorers . They should also label significant countries, oceans, and other relevant places.

Discuss the degree to which goals of different sixteenth-century explorers were similar or different. How significant were the explorations compared to that of Magellan? What were their opportunities and risks? What were the geographic implications of their voyages of exploration?

Conclude by assigning student essays that compare any two explorers sailing for different countries. Compile the essays into a class book that can be shared with others in the school library and with parents at Open House.

Students can create illustrations of the explorers and places they explored to accompany their essays.

Assessment

Assessment is based on student products created throughout the unit. The focus questions provide a framework for evaluating the lesson. Students should be able to:

- describe some of the characteristics of early explorers
- explain the aims, obstacles, and accomplishments of the explorers
- trace the roues of the early explorers
- describe some of the early explorations of the Americas.

Extended and Correlated Activities

Working within groups, create a class newspaper reporting on Magellan's voyage of circumnavigation of the globe. Divide tasks so that each group is responsible for a different leg of the journey. One group should write from the perspective of the Portuguese. In addition to

news articles, feature stories, and editorials, include cartoons, maps, drawings, advertisements, and letters to the editor. Use information from entries in the student journals to write materials for the newspaper. Use the newspaper as a teaching tool for other classes.

Students imagine they are members of an exploration team sailing from Europe to America, the Philippines, or India and write a postcard home describing the land you have explored. Include the physical geography, climate, plants and animals, of the land you are exploring. How does this land differ from your home country?

Find illustrations by artists that drew pictures of images of these new lands that were being explored. How did these images portray the "'New World?" Did they exaggerate? Would you have joined an exploration if you had seen these pictures before leaving on the voyage? Use the sketches of Flemish engraver Theodore de Bry as a source.

Investigate what life was like on a ship in the sixteenth century? How large were these vessels? What were the living quarters like? How was food prepared? Would you have to bring supplies for the entire journey? Where could you expect to get additional supplies?

Read accounts of Alvar Nuñez Cabeza de Vaca and Esteban from their journals which tell of their journey through the American Southwest to the west coast of Mexico. Explain how these "explorers" differed from others who searched for wealth and enslaved native peoples they encountered. What are the lessons that can be learned from their experiences?

Compare modern astronauts to explorers of the late fifteenth and sixteenth centuries. What did they have in common? How did advances in technology help promote voyages of exploration in the fifteenth century and exploration of space in the latter part of the twentieth century?

Students compare two different viewpoints about Columbus' exploration in the Americas. Read *Encounter* by Jane Yolan (1992) and Columbus by Ingri & Edgar Parin D'Aulaire (1955) and compare the perspectives of the Native Indians and the explorer. How were the viewpoints different? What impact did Columbus' exploration have on the indigenous peoples? Why were perspectives of the stories so different? What can be said about the exploration and settlement of lands that were already inhabited?

Resources for the Sample Topic

General Resources for Teachers and Students

Bakeless, John. *America a First Explorers: The Eyes of Discovery*. New York: Dover Publications, 1989. This is an excellent teacher reference. Bakeless using journals, diaries,

and letters, reconstructs the experiences of these explorers as they encountered a seemingly untouched New World.

Bitossi, Sergio. *Ferdinand Magellan.* (Why We Became Famous series). Translated by Stephen Thorne and illustrated by Severino Baraldi. New York: Silver Burdett, Co., 1985. A good account of the voyage using information gathered from Antonio Pigafetta's journal. The author creates dialogue to enhance the story line. An excellent illustrated time line in the appendix traces events during Magellan's lifetime.

Blackwood, Alan. *Ferdinand Magellan.* Bookwright, 1986. The story of Magellan's voyage from Spain to the Pacific and the first circumnavigation of the world is told in this book. Although out of print, this resource may be found in most libraries.

*Calliope World History for Young Readers*_Vol. 2, No. 3 (January/February 1992), pp. 18-22. This issue of *Calliope* follows the theme "Great Explorers to the West" and contains articles on Spain entering the Age of Discovery, the Straits of Magellan, Columbus, and Cabot and Frobisher's search for the Northwest Passage. Back issues of *Calliope* a companion magazine to *Cobblestone.* may be obtained from Calliope, 30 Grove Street, Peterborough, NH 03458.

The Cobblestone American History CD-ROM: 1980-1994. Cobblestone Publishing, Inc., 1995. A full-text database with a menu-driven search strategy makes for easy retrieval of *Cobblestone* articles which appeared in issues between 1980 and 1994. Maps, puzzle grids, and diagrams are included, however, illustrations do not appear. Articles and lists of references can be either printed or exported to a disk. A printed index is included with the CD-ROM.

Columbus and the Age of Exploration. Illustrated by Ken Stott. New York: Franklin Watts, 1985. An overview of Christopher Columbus and other explorers ranging from Vasco da Gama to Francis Drake is provided in this book. Life on the sea and the motivations for exploring are well described.

D'Aulaire, Ingri and Edgar Parin. *Columbus.* New York: Dell Publishing, 1955.

Grant, Neil. *The Great Atlas of Discovery.* Illustrated by Peter Morter. New York: Alfred A. Knopf, 1992. Each map in this well illustrated atlas focuses on a topic or theme, from the urge to explore to modern exploration.

Grosseck Joyce and Elizabeth Attwood. *Great Explorers.* Grand Rapids, MI: Gateway Press, Inc., 1988. Daring people throughout history who were bold enough to venture into the unfamiliar world is the subject of this general survey from the Vikings to Neil Armstrong. Chapters on John Cabot, Vasco da Gama, Ferdinand Magellan, Jacques Cartier, Hernando de Soto, and Henry Hudson are helpful in the study of this unit.

Hargrove, Jim. *Ferdinand Magellan: First Around the World.* Chicago: Childrens Press, 1990. A good readable biography based on the journal of Antonio Pigafetta. This well illustrated

book provides a great deal of information on Magellan and his voyage and includes a useful timeline and glossary of terms.

Humble, Richard and Richard Hook. *The Voyage of Magellan.* New York: Franklin Watts, 1989. A short, readable account of Magellan's voyage. *The Age of Leif Erikson* (Watts, 1989) by the same author is another in a series on exploration.

Jacobs, William Jay. *Magellan: Voyager with a Dream.* New York: Franklin Watts, 1994. A good, basic survey of Magellan's voyage of discovery. Jacobs includes discussion of the intrigues of court and petty jealousies which may have laid the basis for mutiny during the long voyage. Recommended for student reading.

Lomask, Milton. *Exploration: Great Lives.* New York: Charles Scribner's, 1988. Brief stories of the lives of 25 "geographical explorers" the adenturers who, through the centuries, have given us our present knowledge of the surface of the earth. This is a good source for short read on Cabot, Cartier, Columbus, Erikson, da Gama, Prince Henry, Magellan, and Vespucci.

Maestro, Betsy and Giulio Maestro. *The Discovery of the Americas.* New York: Morrow, 1991. This book offers an even-handed introduction to the major explorers of the New World, including Columbus, Cabot, Vespucci, and Magellan. A thorough timeline is provided as an appendix.

Noonan, Jon. *Ferdinan Mazellan.* Illustrated by Yoshi Miyake. New York: Crestwood House, 1993. A short, easy-to-read biography of Ferdinand Magellan gives students a taste of the dramatic voyage to the Philippine d e continuation of the voyage of circumnavigation by the 18 remaining crew members. This book is out of print, but copies are available from most libraries.

Poole,Frederick King. *Early Exploration of North America.* New York: Franklin Watts, 1989. Nicely illustrated, this volume includes accounts of most of the significant explorers of the 15th and 16th centuries. It also includes a section assessing the accomplishments and significance of the explorers. Although out of print, copies are available at most libraries.

Sanderlin, George. *First Around the World: A journal of Magellan's Voyage.* New York: Harper & Row, 1964. An exceptional retelling of the story of Magellan's voyage based entirely on the Pigafetta journal. Sanderlin does a masterful job of excerpting engaging sections of Pigafetta's journal and bridging them with short narratives. This work, although out of print, is available at libraries and is highly recommended for teacher reading. Any number of the stories are suitable for reading aloud.

Sansevere-Dreher, Diane. *Explorers Who Got Lost.* New York: Tom Doherty Associates, 1992. An interesting and irreverent rethinking of the achievements of many famous explorers, including Columbus, Cabot, and Magellan.

Skefoff, Rebecca. *Ferdinand Magellan and the Discovery of the World Ocean* (World Explorers series). New York: Chelsea House, 1990. An exceptionally good account of the life and

times of Ferdinand Magellan. Based on Pigafetta's journal, this is a complete view of the sixteenth century world.

Yolan, Jane. *Encounter*, illustrated by David Shannon. San Diego: Voyager Books, Harcourt Brace & Co., 1992.

Additional Resources

Alper, Ann. *Forgotten Voyager*. Carolrhoda, 1991. This book documents what is known about Amerigo Vespucci who charted much of the coasts of South and Central America in the early 1500s and for whom the continents, of the Western Hemisphere are named.

Ash, Maureen. *Vasco Niiftez de Balboa* (The World's Great Explorers series). Chicago: Children's Press, 1990. A well-illustrated and thorough study of Balboa and his many expeditions in America. The books delves into the motives for exploration as well as the political intrigues which surrounded the expeditions. Although challenging reading, this is an excellent resource book for students.

Asikinack, Bill and Kate Scarborough. *Exploration into North America*. Parsippany, NJ: New Discovery Books, 1995. *Exploration into North America* is a survey of North American history from the American Indian perspective. This well-illustrated book describes the early migration of peoples to North America, encounters with European explorers and settlers, and the lives of modern-day American Indians.

Baker, Betty. *Walk the World's Rim*. New York: Harper, 1965. Chaklo, an American Indian boy, travels from what is now Texas to Mexico City in the 16th century with a black slave, Estéban; Cabeza de Vaca; and two other Spanish explorers. See also A Stranger and Afraid (Macmillan, 1972).

Blanchard, Anne. *Navigation: A 3-Dimensional Exploration*. New York: Orchard Books, 1992. This pop-up book illustrates the advances in navigational technology from the time of Columbus through the present day. It is useful for illustrating the difficulty of early ocean exploration. Although out of print, this source is available from many libraries.

Blumberg, Rhoda. *The Remarkable Voyages of Captain Cook*. Bradbury, 1991. This work by a popular author describes Captain Cook's three voyages from England to the South Pacific islands of Polynesia and Melanesia in the eighteenth century.

Clifford, Mary Louise. *When the Great Canoes Came*. Illustrated by Joyce Haynes. Gretna, Louisiana: Pelican, 1993. Although a fictionalized recreation, *When the Great Canoes Came* tells the story of the encounters between English settlers and American Indians from the perspective of the Powhatan Indians.

Conrad, Pam. *Pedro's Journal*. Caroline House, 1991. This novel is about one of three ship's boys aboard the Santa Maria who records his observations and adventures in a journal.

Explorers and Settlers: A Sourcebook on Colonial America. Edited by Carter Smith. American Albums series. Brookfield, Connecticut: Millbrook Press, 1991. An examination of the exploration and settlement of colonial America by the Spanish, French, English, and Dutch with illustrations from the Library of Congress collections.

Faber, Harold. *The Discoveries of America.* New York: Charles Scribner's Sons, 1992. Ideal as a reference for teachers and more advanced readers, this volume covers the explorations of America from the earliest American Indians and Norsemen to the discovery and settlement of the Western states.

1492 Discovery. Invasion, Encounter: Sources and Interpretations. Edited by Marvin Lunenfeld. Lexington, MA: D. C. Heath, 1991. This is a thorough study of the Colombian exchange recommended as a teacher resource. Part one, "Discovery," offers a variety of viewpoints on why Columbus set sail and how he has been viewed. "Invasion" deals-with the impact of Columbus' voyage and those who followed on Europe and the Americas. "Encounter" offers a variety of different perspectives of American Indians towards European explorers and vice versa.

Fisher, Leonard. *Prince Henry the Navigator.* New York: Macmillan, 1990. Prince Henry of Portugal founded an important navigation school, instigated improvements in the design of sailing ships and navigational
instruments, and encouraged exploration.

Fritz, Jean. Brendan the Navigator: *A History Mystery about the Discovery of America.* Putnam, 1979. This book portrays the life of Saint Brendan and chronicles his legendary voyage to North America, a voyage made long before the Vikings arrived. See also Fritz's *Where Do You Think You're Going Christopher Columbus?* (Putnam, 1980) and *Around the World in a Hundred Years: Henry the Navigator to Magellan* (Putnam, 1993).

Goodnough, David. *Francis Drake, Sea Pirate.* New York: Troll, 1979. An account of the life of the famous English navigator is given in this book.

Haskins, James. *Against All Opposition.* Walker, 1992. A collective biography of African Americans who risked their lives to explore the unknown.

Levinson, Nancy Smiler. *Christopher Columbus: Voyager to the Unknown.* Lodestar, 1990. An engaging narrative in this book presents new views of the great explorer; the reading level is about that of most fifth graders. Clear maps and primary source material make this book a good reference for teachers and students.

The Log of Christopher Columbus' First Voyage to America: In the Year 1492, as Copied Out in Brief by Bartholomew Las Casas. Transcribed by Bartholomew Las Casas. Linnet Books, 1989. Columbus's log was "copied out in, brief" by his companion. The accompanying illustrations, signatures, and maps make this an excellent primary source for fifth graders.

Marrin, Albert. *The Sea King: Sir Francis Drake and His Times*. Atheneum, 1995. A well-researched, gripping account of the perils of Drake's sea voyages as well as the politics of the time. The book is very detailed and includes an extensive bibliography.

Matthews, Rupert. *The Voyage of Columbus*. Bookwright, 1989. This book is amply illustrated with an inviting format and an easily followed narrative.

O'Dell, Scott. *The King's Fifth*. Boston: Houghton Mifflin, 1966. This adventure story is told through the reminiscences of Francisco Coronado's fifteen-year -old cartographer.

Pelta, Kathy. *Discovering Christopher Columbus: How History is Invented*. Minneapolis: Lerner Publications, 1991. An interesting look at how the story and history of Columbus and his voyages have evolved over the centuries. While rather difficult for some fifth grade readers, Pelta's book encourages the development of critical thinking skills using a well-known historical subject.

Soule, Gardner. *Christopher Columbus: On the Green Sea of Darkness*. Cavendish, 1991. A biography of Columbus from his early career through his arrival in America. Included are maps, primary illustrations, and excerpts from Columbus's journal. Attention is given to the new riches Columbus culled from the New World.

Stein R. Conrad. *The Story of Marquette and Joliet*. Chicago: Children's Press, 1981. One of the CORNERSTONES OF FREEDOM series, this book is brief and easily read. Although out of print, copies of this volume may be found at most libraries.

The *Voyages of Christopher Columbus*. Edited by John D. Clare. New York: Harcourt Brace Jovanovich, 1992. Perhaps the most valuable aspect of this book on Columbus is the appendix, "How do we know?" which concisely evaluated the different kinds of sources used in historical research.

Valdman, Carl and Alan Wexler. *Who Was Who in World Exploration*. New York: Facts on File, 1992. A great resource for teachers, this book is filled with facts on a wide range of explorers.

Weisberg, Barbara. *Coronado's Golden Quest*. Illustrated by Mike Eagle. New York: Steck-Vaughn Company, 1993. In a determined effort to find the fabled seven cities of gold, Conquistador Francisco Coronado marched through the southwestern United States and encountered Indians who fought to protect their land.

Welton, Ann. Ex*plorers and Exploration: The Best Resources for Grades 5 Through 9*. Oryz, 1993. This annotated bibliography includes brief historical narratives on explorers and areas explored from the Vikings to the American West and from polar regions to space.

Yue, Charlotte. *Christopher Columbus: How He Did It*. Houghton, 1992. Yue discusses the more practical aspects of Columbus' first voyage including the reasons for the exploration and the scientific and geographical assumptions on which he based his plans.

Visual and Performing Arts Resources

Circa 1492: Art in the Age of Exploration. Edited by Jay A. Levenson. New Haven, CT: Yale University Press, 1991. This comprehensive work, compiled to accompany an exhibit at the National Gallery of Art commemorating the 500th anniversary of the European discovery of America, gives a portrait of the world in 1492 through the arts. This detailed work is recommended for teacher background and a source for artworks of pre-sixteenth century Africa, the Americas, Asia, and Europe.

The European Vision of America (18 slides, audiocassette). National Gallery of Art Extension Services, Washington, DC 20565 (free loan program). Following the voyage of Christopher Columbus to the West Indies, European artists began to produce their visions of the Americas in paintings, prints, sculpture, and decorative arts. This program deals with these diverse views of America from the sixteenth through mid nineteenth centuries. Part 1 discusses early interpretations of the new land; part 2 reviews the symbols and personifications of America, the image of the American Indian, and the emerging independent nation. Music of the period is included to augment the visuals and narration. Although designed for use with high school students, this program could be adapted for use with this unit.

Hand in Hand: An American History Through Poetry. Collected by Lee Bennett Hopkins, illustrated by Peter M. Fiore. New York: Simon and Schuster, 1994. This unique perspective of events in American history helps students understand the American experience through poetry. An original painting or sketch by artist Peter Fiore accompanies each of the poems which are compiled around chronological periods in American history. This is a good classroom resource book.

Appendix II-1

Explorer	Country	Aims	Obstacles	Accomplishments
Magellen				
Columbus				

Appendix II-2

Exploration, The First Fifty Years

TIMELINE

1487 Bartolomeo Dias rounds the Cape of Good Hope
1492 Columbus crosses the Atlantic to the West Iridies
1493 March 15, Columbus returns to Spain
1493 May 4, Line of Demarcation "divides the world"
1493 Columbus's second voyage
1494 Treaty of Tordesillas
1497 John Cabot to Newfoundland
1498 John and Sebastian Cabot to Nova Scotia and New England
1498 Vasco da Gama reaches India
1498 Columbus' third voyage
1499 Vespucci sailed to northern South America and Amazon
1500 Cabral lands in Brazil
1501 Vespucci's second voyage to Brazil
1502 Columbus's fourth voyage
1513 Balboa crossed the Isthmus of Panama to the Pacific Ocean
1513 Ponce de León to Florida
1519 Magellan begin his voyage of circumnavigation
1519 Cortes to Mexico
1521 Magellan killed in the Philippines
1522 part of Magellan's crew returns to Spain
1524 da Verrazano to New York
1531 Pizarro to Peru
1534 Cartier's first voyage to Labrador
1535 Cartier's second voyage to St. Lawrence River and Quebec

Appendix II-3

Treaty of Tordesillas

King John of Portugal was dissatisfied with the line of demarcation Pope Alexander VI had drawn in 1493 to separate Spanish and Portuguese discoveries. He argued that the Pope knew little of geography and that the division of the world gave too much to the Spanish. King John persuaded the Spanish to agree to moving the from 100 leagues west of the Cape Verde Islands to approximately 49 degrees west longitude, 370 leagues west of the islands. This change gave Portugal a claim to Brazil which some believe the Portuguese had discovered before sending out the voyage of Pedro Cabral in 1500.

... Whereas a certain controversy exists between the said lords [kings of Portugal and Spain] ... as to what lands, of all those discovered in the ocean sea up to the present day, the date of this treaty, pertain to each one of ... [them]; therefore, for the sake of peace and concord, and for the preservation of the relationship and love of the said King of Portugal for the said King and Queen of Castile, Aragon, etc. it being the pleasure of their Highnesses, they ...covenanted and agreed that a boundary or straight line be determined and drawn north and south, from pole to pole, on the said ocean sea, from the Arctic to the Antarctic pole. The boundary or line shall be drawn straight ...at a distance of three hundred and seventy leagues west of the Cape Verde Islands, being calculated by degrees....And all lands, both islands and mainlands, found and discovered already, or to be found and discovered hereafter, by the said King of Portugal and by his vessels on this side of the said line...determined as above, toward the east in either north or south latitude, on the eastern side of the said bound, provided... [it] is not crossed, shall belong to and remain in the possession of, and pertain forever to, the said King of Portugal and his successors. And all lands, both islands and mainlands, found or to be found hereafter, ...by the said King and Queen of Castile, Aragon, etc. and by their vessels, on the western side of the said bound, determined as above, after having passed the said bound toward the west, in either its north or south latitude, shall belong to ... the said King and Queen of Castile, Leon, etc. and to their successors.

... The said representatives promise and affirm ... that from this date no ships shall be dispatched--namely as follows: the said King and Queen of Castile, Leon, Aragon, etc. for this part of the bound...which pertains to the said King of Portugal...nor the said King of Portugal to the other side of the said bound which pertains to the said King and Queen of Castile, Aragon, etc-for the purpose of discovering and seeking any mainlands or islands, or for the purpose of trade, barter, or conquest of any king....

.....

Meaning of words as used in this reading:

concord - feeling of agreement
Castile, Aragon, Leon, etc. - lands held by Isabel and Ferdinand which were united as Spain

covenanted - pledged or guaranteed
leagues - a measure of distance, approximately 3 miles; however, it varies at different time periods
bound - boundary

Questions:

- Why did Spain agree to the change?
- When the treaty was signed had either Spain or Portugal sailed into the Pacific Ocean?
- Did the new line of demarcation run only north to south in the Atlantic or did it encircle the globe dividing land in the Pacific as well?
- If you were the king or queen of another European country how would you regard the Treaty of Tordesillas?

Writing Activity:

Write a letter to the pope as King Henry VII of England and explain your opinions about the Line of Demarcation of 1493 and the Treaty of Tordesillas of 1494. The pope is the head of the Catholic Church and England is a Catholic country at this time.

Appendix II-4

Pigafetta's Journal

Magellan had five ships supplied for the voyage, the San Antonio Trinidad Victoria Concel2ci6n and the Santiago The San Antonih and Trinidad we" the larger ships, the Santiago the smallest. The Victoria was the only ship to return to Seville. Antonio Pigafetta, a Venetian, traveling with Magellan kept a journal which he presented to King Charles on his return to Spain. Pigafetta begins his journal...

> ... On Monday morning, August 10 [1519] ... the fleet, having been supplied with all the things necessary for the sea ... made ready to leave the harbor of Seville.... The ships reached ... San Lúcar, which is a port by which to enter the Ocean Sea. ...We remained there for a considerable number of days in order to finish providing the fleet with some things that it needed. ...We left ... San Lúcar on Tuesday, September 20 and took a southwest course.

Six days later the fieet anchored off the island of Tenerife, one of the Canary Islands, off the west coast of Africa. Aware that King Manuel of Portugal had sent a fleet to intercept him, Magellan left the Canary Islands and sailed south-southwest to avoid the Portuguese. This maneuver took his fleet into an area of dead calm called the doldrums. The Portuguese, thinking that Magellan would not sail into the doldrums, gave up the search and returned home.

> ...At midnight of Monday, October 3, the sails were trimmed toward the south, and we took to the open Ocean Sea, passing between Cape Verde and its islands in fourteen and one-half degrees [north latitude]. Thus for many days did we sail along the coast of Guinea ... with contrary winds, calms, and rains without wind, until we reached the equinoctial line [the equator], having sixty days of continual rain.
>
> ... Before we reached the line many furious squalls of wind, and currents of water struck us head on in fourteen degrees [north latitude). As we could not advance, and in order that the ships might not be wrecked, all the sails were struck; and in this manner did we wander hither and yon on the sea, waiting for the tempest to cease, for it was very furious. When it rained there was no wind. When the sun shone, it was calm.
>
> Certain large fishes called *tiburoni* [sharks] came to the side of the ships. They have terrible teeth, and whenever they find men in the sea they devour them. We caught many of them with iron hooks, although they are not good to eat unless they are small....

On December 13, 1519 the fleet made port in Brazil near the river named for January, Rio de Janeiro. Here Pigafetta relied on hearsay and told some "tall tales" about the Guarani Indians they met.

> ... That land of Brazil is wealthier and larger than Spain, France, and Italy, put together, and belongs to the king of Portugal. The people of that land are not Christians, and have no

manner of worship. They live according to the dictates of nature, and reach an age of one hundred and twenty-five and one hundred and forty years.

From Rio de Janeiro, Magellan sailed along the coast to a great estuary which he believed to be a passage through the continent. He was disappointed to discover that it was only a great river which was named the Rio de la Platt because of the silver in the area. He continued to sail south. Some of the Spanish captains demanded that he return to the Rio de la Plata. When Magellan refused they spread rumors that he was a Portuguese spy and was leading the fleet to destruction. Mutiny on the evening of April 1, 1520 almost ended the exploration. Magellan succeeded in putting down the uprising with only one man killed. Magellan ordered that the body of Luis de Mendoza be quartered, spitted on poles and left on the shore. He had Juan de Cartagena, one of the ringleaders, and a priest involved in the mutiny arrested. Even while under arrest they plotted still another mutiny and were court-martialed and marooned on the Argentine coast. Other mutineers were put in chains and held for three months before granting them a pardon.

On October 18, 1520 the fleet left Rio Santa Cruz in southern Argentina and headed south into a storm.

... Going to fifty-two degrees toward the ... [south) pole, we found a strait ... surrounded by very lofty mountains laden with snow. There it was impossible to find bottom for anchoring, [and) it was necessary to fasten the moorings on land twelve or fifteen yards away.

Had it not been for the captain-general, we would not have found that strait, for we all thought and said that it was closed on all sides. But the captain-general who knew where to sail to find a well-hidden strait, which he saw depicted on a map in the treasury of the king of Portugal...

Faced with a terrible storm and treacherous waters the ships ventured through the strait and on November 28, 1520 the fleet, now consisting of only three ships, entered the Pacific Ocean. Magellan steered a course directly into the open ocean rather than sail up the coast of Chile. They sailed for two months without seeing land. The crew had -little to eat and no fresh fruit or vegetables for nearly three months.

... We were three months and twenty days without getting any kind of fresh food. We ate biscuit, which was no longer biscuit, but powder of biscuits swarming with worms, for they had eaten the good. It stank strongly ... of rats. We drank yellow water that had been putrid for many days.

We also ate some ox hides that covered the top of the, mainyard to prevent the yard from chafing the shrouds, and which had become exceedingly hard because of the sun, rain, and wind. We left them in the sea for four or five days, and then placed them for a few moments on top of the embers, and so ate them; and often we ate sawdust from boards. Rats were sold for one-half ducat apiece, and even we could not get them.

But above all the other misfortunes the following was the worst. The gums of both the lower and upper teeth of some of our men swelled, so that they could not eat under any circumstances and therefore died. Nineteen men died from that sickness [scurvy]....

We sailed about four thousand leagues during those three months and twenty days through an open stretch in that Pacific Sea. In truth it is very pacific, for during that time we did not suffer any storm....

... We discovered on Wednesday, March 6, a small island to the northwest, and two others toward the southwest, one of which was higher and larger than the other two.

The captain-general wished to stop at the large island and get some fresh food, but he was unable to do so because the inhabitants of that island entered the ships and stole whatever they could lay their hands on, so that we could not protect ourselves....

Therefore, the capital-general in wrath went ashore with forty armed men, who burned some forty of fifty houses together with many boats, and killed seven men.

... At dawn on Saturday, March 16, 1521, we came upon ... an island named Samar. The following day, the captain-general desired to land on another island which was uninhabited ... in order to be more secure, and to get water and have some rest. He had two tents set up on the shore for the sick and had a sow killed for them.

On ... March 18, we saw a boat coming toward us with nine men in it. Therefore, the captain-general ordered that no one should move or say a word without his permission. When those men reached the shore, their chief went immediately to the captain-general, giving signs of joy because of our arrival. Five of the most ornately adorned of them remained with us, while the rest went to get some others who were fishing, and so they all came.

> The captain-general seeing that they were reasonable men, ordered food to be set before them, and gave them red caps, mirrors, combs, bells, ivory ... and other things. When they saw the captain's courtesy, they presented fish, a jar of palm wine, ...and two coconuts. They had nothing else then, but made us signs with their hands that they would bring ... rice and coconuts and many other articles of food within four days.

Magellan had landed in the Philippines which later the Spanish called the Western Islands as their farthest western possession. The Portuguese named them the Eastern Islands to support their claim that they lay in the east in lands designated to Portugal by the Treaty of Tordesillas. In 1542 the islands were named the Philippines for Philip, a son of King Charles I of Spain. While traveling from island to island, Magellan came across men who understood Malay and was convinced that he had reached the prized Moluccas. Magellan had with him a Moluccan slave, Enrique.

...The next day ... the captain-general sent his slave, who acted as our interpreter, ashore in a small boat to ask the king if he had any food to have it carried to the ships; and to say that they

would be well satisfied with us, for he and his men had come to the island as friends and not as enemies.

The king came with six or eight men in the same boat and entered the ship. He embraced the captain-general to whom he gave three porcelain jars ... full of raw rice, two very large fish, and other things. The captain-general gave the king a garment of red and yellow cloth ... and a fine red cap; and to the others ... knives and ... mirrors....

Then the captain showed him cloth of various colors, linen, coral ornaments, and many other articles of merchandise, and all the artillery, some of which he had discharged for him, whereat the natives were greatly frightened. Then the captain-general had a man [wearing full armor] ... placed ... in the midst of three men armed with swords and daggers, who struck him on all parts of the body. Thereby was the king rendered almost speechless.

The captain-general told him through the slave that one of those armed men was worth one hundred of his own men. The king answered that that was a fact....

Traveling to the island of Cebu a few days later, Magellan made friends with the local king and after discussing matters of religion promised the king Spain's protection.

> ... The captain and the king sat down in chairs of red and violet velvet, the chiefs on cushions, and the others on mats.... The captain told the king that he was going to Spain, but that he would return again with so many forces that he would make him the greatest king of those regions, as he had been the first to express a determination to become a Christian.

The king, lifting his hands to the sky, thanked the captain, and requested him to let some of his men remain with him, so that he and his people might be better instructed in the faith. The captain replied that he would leave two men to satisfy him, but that he would like to take two of the children of the chiefs with him, so that they might learn our language, who afterward on their return would be able to tell the others the wonders of Spain....

The captain led the king by the hand ... in order to baptize him. He told the king that he would call him Don Carlos, after his sovereign the emperor. ...Five hundred men were baptized before mass.

Chief Cilapulapu of Mactan, a nearby island, refused to give tribute to Magellan or to the newly converted King Humabon of Cebu. Magellan decided to punish Cilapulapu and invited friendly chiefs to witness how the Christians supported by their God would triumph.

> ... When morning came forty-nine of us leaped into the water up to our thighs, and walked through water for more than two crossbow flights before we could reach the shore. The boats could not approach nearer because of certain rocks in the water. The other eleven men remained behind to guard the boats.

When we reached land, those men had formed in three divisions to the number of more than one thousand five hundred persons. When they saw us, they charged down upon us with exceeding loud cries, two divisions on our flanks and the other on our front....

The musketeers and crossbowmen shot from a distance for about a half-hour, but uselessly. ...When the natives saw that we were shooting our muskets to no purpose...they redoubled their shouts [and] ... determined to stand firm. ...They shot so many arrows at us and hurled so many bamboo spears (some of them tipped with iron) at the captain-general, besides pointed stakes hardened with fire, stones, and mud, that we could scarcely defend ourselves.

> ... So many of them charged down upon us that they shot the captain through the right leg with a poisoned arrow. On that account, he ordered us to retire slowly, but the men took to flight, except six or eight that remained with the captain.
>
> ... The mortars in the boats could not aid us as they were too far away. So, we continued to retire for more than a good crossbow flight from the shore always fighting up to our knees in the water.

The natives continued to pursue us, and picking up the same spear four of six times, hurled it at us again and again. Recognizing the captain, so many turned upon him that they knocked his helmet off his head twice, but he always stood firmly like a good knight, together with some others.

Thus we did fight for more than one hour, refusing to retire farther. An Indian hurled a bamboo spear into the captain's face, but ... [Magellan] immediately killed him with his lance, which he left in the Indian's body. Then, trying to lay hand on sword, he could draw it but halfway, because he had been wounded in the arm with a bamboo spear.

When the natives saw that, they all hurled themselves upon him. One of them wounded him on the left leg with a large cutlass.... That caused the captain to fall face downward, when immediately they rushed upon him with ' iron and bamboo spears and with their cutlasses, until they killed our mirror, our light, our comfort, and our true guide.

> ... Thereupon, beholding him dead, we, wounded, retreated as best we could to the boats, which were already pulling off. The Christian king would have aided us, but the captain charged him before we landed ... to stay to see how we fought. When the king learned that the captain was dead, he wept.

The Spaniards, confused and fearful after Magellan's death became distrustful of their ally, King Humabon, and removed all their goods from his village. Cilapulapu threatened to bring together other native chiefs against Humabon if he did not join them. Humabon and Magellan's slave, who had turned against the Spanish, planned a trap. When a party of Spaniards came to collect the jewels Humabon promised to send to the King of Spain, they were seized and all but one were killed. Juan Serrano who had been elected along with another to succeed Magellan was held prisoner.

... We immediately weighed anchor and discharging many mortars into the houses, drew in nearer to the shore. While thus discharging our pieces we saw Juan Serrano in his shirt bound and wounded, crying to us not to fire any more, for the native would kill him. ...He begged us earnestly to redeem him with some of the merchandise; but Juan Carvalho, his boon companion, and others would not allow the boat to go ashore....

Soon after leaving Cebu the Concepción leaking badly was burned off the Island of Bohol in the Philippines. The fleet consisting now of only two ships, the Victoria and Trinidad sailed to the Spice Islands in November, 1521. The Trinida was taking water and had to be beached for repairs. Fifty-three men abroad the Trinidad, fearing that they would starve on the voyage back to Spain, remained on Timor as the Victoria set sail in December with a cargo of cloves. The Trinida was repaired and in April 1522 sailed for Panama fighting adverse trade winds and was driven back to the Moluccas where it was captured by the Portuguese and the captain, Juan Carvalho, hung for piracy.

The Victoria sailed around the Cape of Good Hope on May 6, 1522.

... Then we sailed northwest for two months continually without taking on any fresh food or water. Twenty-one men died during that short time.... Had not God given us good weather we would all have perished of hunger.

Finally ... we went to the islands of Cape Verde. Wednesday, July 9, we reached one of those islands called Santiago, and immediately sent the boat ashore for food, with the story for the Portuguese that we had lost our foremast under the equinoctial line, and when we were resetting it, our captain-general had gone to Spain with the other two ships. With those good words and with our merchandise, we got two boatloads of rice.

We charged our men when they went ashore in the boat to ask what day it was, and they told us that it was Thursday.... We were greatly surprised for it was Wednesday with us, and we could not see how we had made a mistake; ...I had set down every day without any interruption. However, as was told us later, it was no error, but as the voyage had been made continually toward the west and we had returned to the same place as does the sun, we had made that gain of twenty-four hours, as is clearly seen.

The boat having returned to the shore again for rice, thirteen men and the boat were detained, because one of them, as we learned afterward in Spain, told the Portuguese that our captain was dead, as well as

others.... Fearing lest we also be taken prisoners by certain caravels, we hastily departed.

...On Saturday, September 6, 1522, we entered the bay of San Lúcar with only eighteen men and the majority of them sick, all that were left of the sixty men who left the Moluccas. Some died of hunger; some deserted at the island of Timor; and some were put to death for crimes. From that time we left that bay of San Lúcar until the present day of our return, we had sailed

fourteen thousand four hundred and sixty leagues, and furthermore had completed the circumnavigation of the world from east to west....

Sanderlin, George, *First Around the World: A Journal of Magellan's Voyage* New York: Harper and Row, 1964.

Appendix II-5

Directions for Making An Astrolabe

Materials: protractor, string, washer, tape, drinking straw

Steps:

1. Measure a piece of string from the center of the flat side of the protractor so that it hangs about three inches below the curved side.
2. Attach a washer to one end of the string.
3. Attach the string to the center of the flat side of the protractor with tape. The end with the washer will hang below the curved side when the protractor is held parallel to the ground.
4. Attach the straw to the protractor with tape so that it lays flat along the flat side.

How to Use:

1. Use the straw like a telescope.
2. Find the moon.
3. Keeping the protractor steady, read the degree mark where the string touches.
4. Subtract 90° from the number where the string touches.
5. Keep a log of the moon's position.

Adapted from: *Creative, Hands-0n Science Experiences Using Free and Inexpensive Materials*, by Jerry De Bruin, illustrated by Charlene Czerniak. Carthage, Illinois: Good Apple, Inc., 1980.

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